

Ignition-Glow Plug System, 1.8L Generic Scan Tool - New Beetle

IGNITION GLOW PLUG SYSTEM

IGNITION, SERVICING

General notes on ignition system

- This section deals specifically with ignition - related components. The other components of the injection and ignition system, see **MULTIPOINT FUEL INJECTION (MFI)** .
- For the electric components to work properly, a voltage of at least 11.5 V is required.
- The battery must only be disconnected and connected with the ignition switched off, since the Engine Control Module (ECM) can otherwise be damaged.
- The Engine Control Module (ECM) is equipped with an On Board Diagnostic (OBD)
- Components marked with * are tested via On Board Diagnostic (OBD), see **DIAGNOSTIC MODE 3: CHECK DTC MEMORY** .
- It is possible that the control module will recognize a malfunction and store a DTC during some tests. Therefore the following work steps must be performed in the mentioned sequence after ending all tests and repairs.
- Check DTC memory, see **DIAGNOSTIC MODE 3: CHECK DTC MEMORY** .
- Erase DTC memory, see **DIAGNOSTIC MODE 4: RESET/ERASE DIAGNOSTIC DATA**
- For completion, generate readiness code, see **READINESS CODE, GENERATING** .

Parts of ignition, removing and installing:

- Vehicles with engine code APH, see **PARTS OF THE IGNITION, REMOVING AND INSTALLING (VEHICLES WITH ENGINE CODE APH)** .
- Vehicles with engine code AWP, AWV, see **PARTS OF THE IGNITION, REMOVING AND INSTALLING (VEHICLES WITH ENGINE CODE AWP, AWV)** .
- Safety precautions, see **SAFETY PRECAUTIONS** .
- Test data, spark plugs, see **TEST DATA, SPARK PLUGS** .

Parts of the ignition, removing and installing (Vehicles with engine code APH)

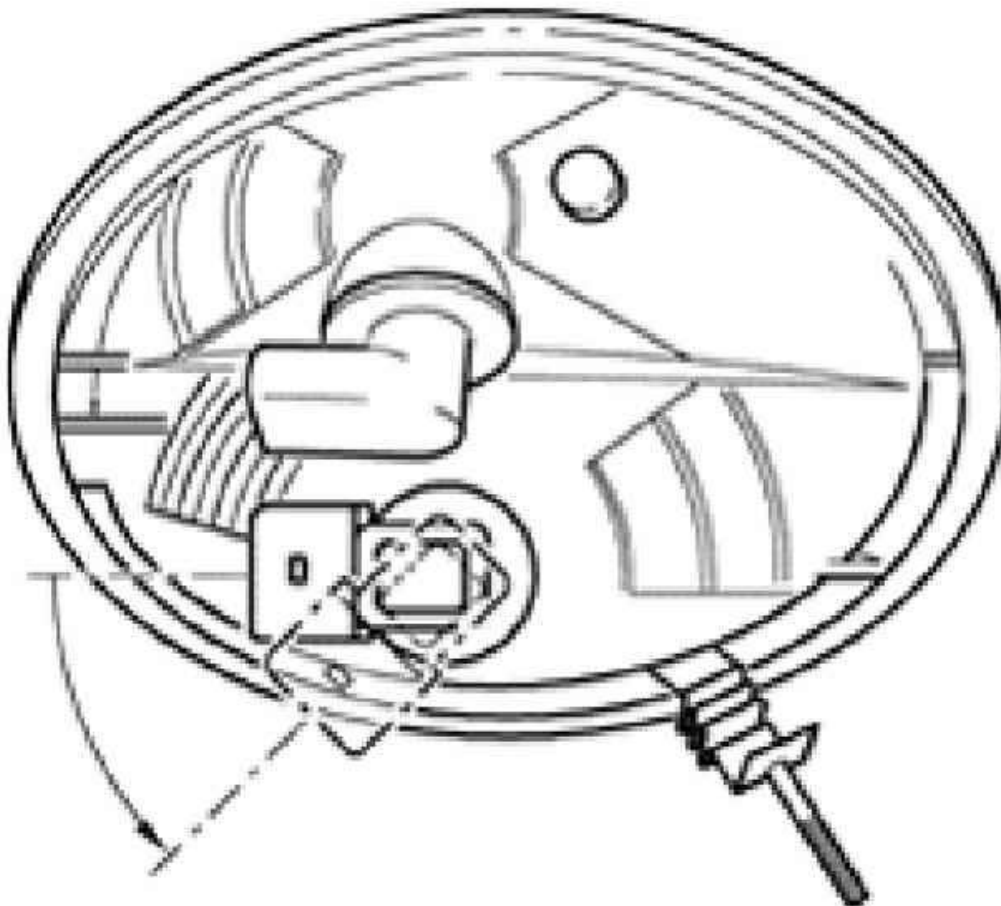
The following list pertains to **Fig. 1** .

1. Connector

- Black, 4-pin

2. Ignition Coil 1 with Power Output Stage -N70-, Ignition Coil 2 with Power Output Stage -N127-, Ignition Coil 3 with Power Output Stage - N291-, Ignition Coil 4 with Power Output Stage -N292-

- Checking, see **IGNITION COILS WITH POWER OUTPUT STAGES, CHECKING**
- 3. **Seal**
 - Replace if damaged
- 4. **Spark plug, 30 Nm**
 - remove and install with 3122 B
 - Type and spark plug gap, see **TEST DATA, SPARK PLUGS**
- 5. **Connector**
 - black, 3-pin
- 6. **10 Nm**
- 7. **Camshaft Position (CMP) Sensor -G40-***
 - Checking, see **CHECK CAMSHAFT POSITION (CMP) SENSOR**
- 8. **25 Nm**
- 9. **Washer**
 - Conical
- 10. **Face plate**
 - For Camshaft Position (CMP) Sensor -G40-
 - note position when installing
- 11. **20 Nm**
 - Tightening torque affects function of Knock Sensor (KS)
- 12. **Knock Sensor (KS) 1 -G61-***
 - Terminals of sensor and connector are gold-plated
 - Checking, see **CHECK KNOCK SENSORS**
- 13. **3-pin harness connector**
 - Terminals are gold-plated
 - Brown for Knock Sensor (KS) 1 -G61-
- 14. **Ground (GND) wire**
 - Do not loosen or tighten unless ignition is switched off.
- 15. **10 Nm**
 - Do not loosen or tighten unless ignition is switched off.
- 16. **3-pin harness connector**
 - Terminals are gold-plated
 - Black for Knock Sensor (KS) 2 -G66-
- 17. **Knock Sensor (KS) 2 -G66-***
 - Terminals of sensor and connector are gold-plated
 - Checking, see **CHECK KNOCK SENSORS**



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Fig. 1: Identifying Parts Of Ignition (Vehicles With Engine Code APH)
 Courtesy of VOLKSWAGEN OF AMERICA, INC.

Parts of the ignition, removing and installing (Vehicles with engine code AWP, AWV)

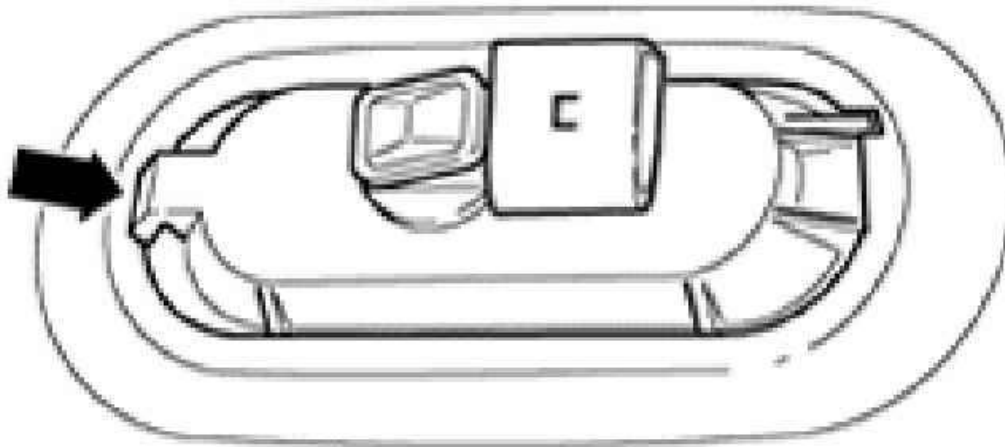
The following list pertains to **Fig. 2** .

1. **Connector**
 - Black, 4-pin
2. **Ignition Coil 1 with Power Output Stage -N70-, Ignition Coil 2 with Power Output Stage -N127-, Ignition Coil 3 with Power Output Stage -N291-, Ignition Coil 4 with Power Output Stage -N292-**
 - Checking, see **IGNITION COILS WITH POWER OUTPUT STAGES, CHECKING**

3. **Snap ring**
 - for Ignition Coil 1 with Power Output Stage -N70-, Ignition Coil 2 with Power Output Stage - N127-, Ignition Coil 3 with Power Output Stage -N291-, Ignition Coil 4 with Power Output Stage - N292-
 - Replace if damaged
4. **Spark plug, 30 Nm**
 - remove and install with 3122 B
 - Type and spark plug gap, see **TEST DATA, SPARK PLUGS**
5. **Connector**
 - black, 3-pin
 - Terminals of sensor and connector are gold-plated
6. **10 Nm**
7. **Camshaft Position (CMP) Sensor -G40-***
 - Checking, see **CHECK CAMSHAFT POSITION (CMP) SENSOR**
8. **25 Nm**
9. **Washer**
 - Conical
10. **Face plate**
 - For Camshaft Position (CMP) Sensor -G40-
 - note position when installing
11. **20 Nm**
 - Tightening torque affects function of Knock Sensor (KS)
12. **Knock Sensor (KS) 1 -G61-***
 - Terminals of sensor and connector are gold-plated
 - Component location: Cylinder block, intake side
 - Checking, see **CHECK KNOCK SENSORS**
13. **Knock Sensor (KS) 2 -G66-***
 - Terminals of sensor and connector are gold-plated
 - Component location: Cylinder block, intake side
 - Checking, see **CHECK KNOCK SENSORS**
14. **Connector**
 - 2-pin
 - Terminals are gold-plated
 - Black for Knock Sensor (KS) 1 -G61-
 - Black for Knock Sensor (KS) 2 -G66-
 - Mark connector before removing
15. **Ground (GND) wire**
 - Do not loosen or tighten unless ignition is switched off.

16. **10 Nm**

- Do not loosen or tighten unless ignition is switched off.



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Fig. 2: Identifying Parts Of Ignition (Vehicles With Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Camshaft adjustment, servicing (Vehicles with engine code AWP, AWV)

Cylinder head, removing and installing:

See **CYLINDER HEAD, REMOVING AND INSTALLING**

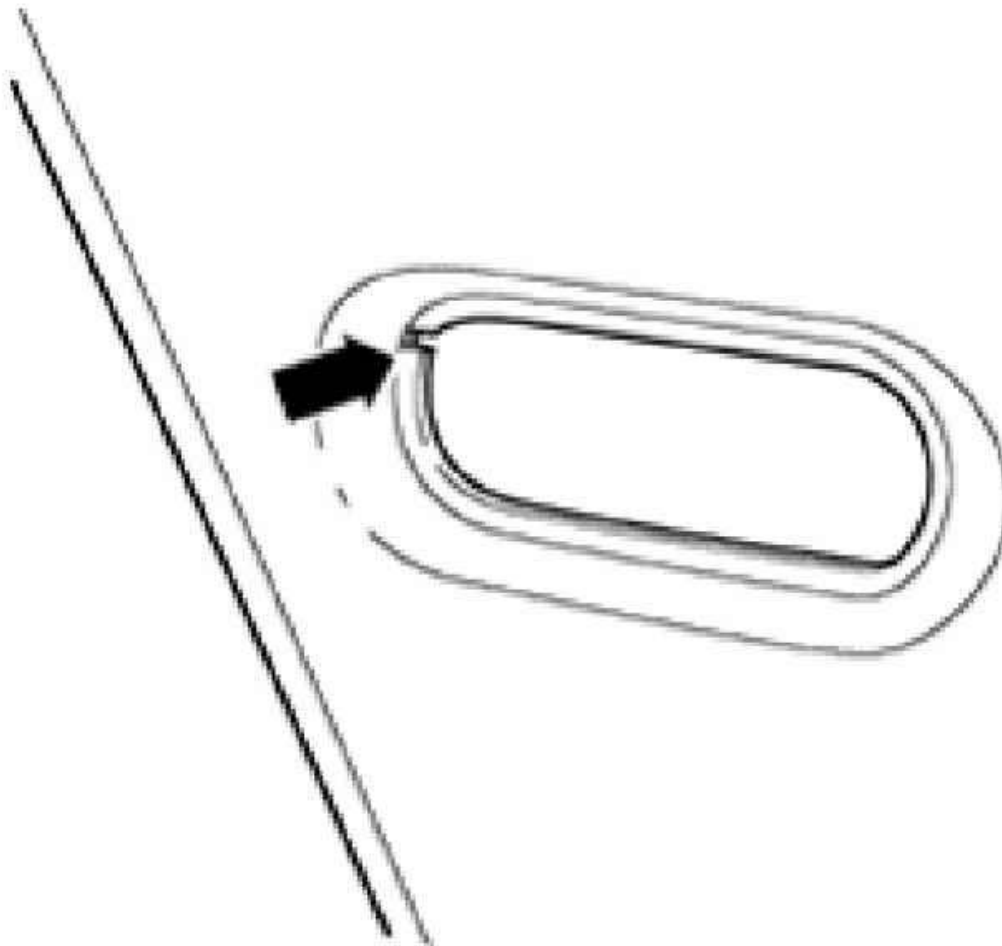
Valvetrain, servicing:

See **VALVE GEAR, SERVICING**

The following list pertains to **Fig. 3** .

1. **Double bearing cap**
2. **10 Nm**
3. **Exhaust camshaft bearing cap**
4. **Exhaust camshaft**
5. **Intake camshaft bearing cap**
6. **Intake camshaft**

7. **Drive chain**
 - Mark direction of travel (installation position) before removing
8. **Camshaft adjuster**
 - Check valves for camshaft adjustment, see **VALVE FOR CAMSHAFT ADJUSTMENT, CHECKING (VEHICLES WITH ENGINE CODE AWP, AWV)**
9. **10 Nm**
10. **Valve -1- for camshaft adjustment -N205-***
 - only together with camshaft adjuster item 8 , replacing
 - Checking, see **VALVE FOR CAMSHAFT ADJUSTMENT, CHECKING (VEHICLES WITH ENGINE CODE AWP, AWV)**
11. **Seal**
 - Rubber/metal seal
 - replace
12. **Seal**
 - replace
13. **Cylinder head**



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Fig. 3: Identifying Camshaft Adjustment, Servicing (Vehicles With Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Safety precautions

WARNING: Observe the following for all installations, especially in engine compartment due to lack of room:

- Route lines of all types (e.g. for fuel, hydraulic, EVAP canister system, coolant and refrigerant, brake fluid, vacuum) and electrical wiring so that the original path is followed.

- **Watch for sufficient clearance to all moving or hot components.**

If test and measuring equipment is required during road test, note the following:

- Test equipment must always be secured to the rear seat and operated from there by a second person.

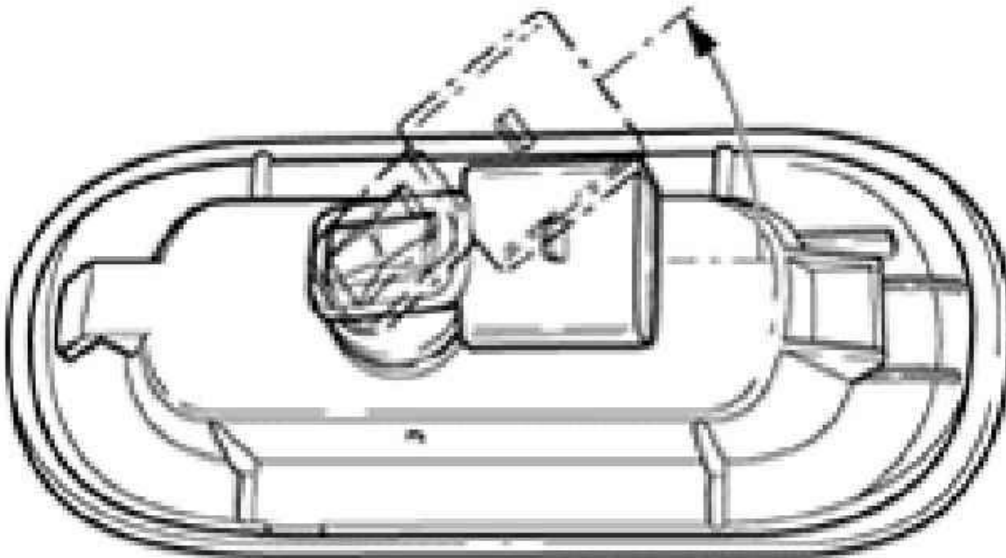
If test and measuring equipment is operated from the passenger seat, the person seated there could be injured in the event of an accident involving deployment of the passenger -side airbag.

To reduce the risk of personal injury and/or damage to the fuel injection and ignition system, always observe the following:

- Do not touch or disconnect ignition wires when engine is running or turning at starting RPM.
- Only disconnect and reconnect wires for injection and ignition system, including test leads, when ignition is switched off.
- If engine is to be cranked at starting RPM without starting:

Vehicles with engine code APH

- Disconnect all 4-pin connectors -2- from the ignition coils -1-.

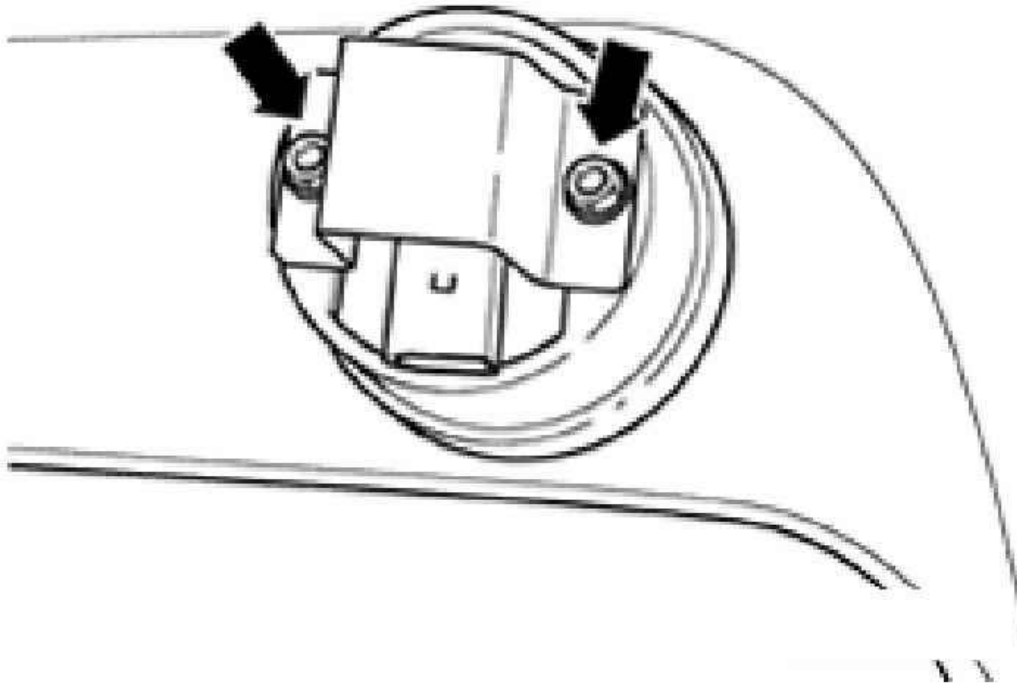


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Fig. 4: Disconnecting 4-Pin Connectors From Ignition Coils (Engine Code APH)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Vehicles with engine code AWP, AWV

- Disconnect all 4-pin connectors -2- from the ignition coils -1-.



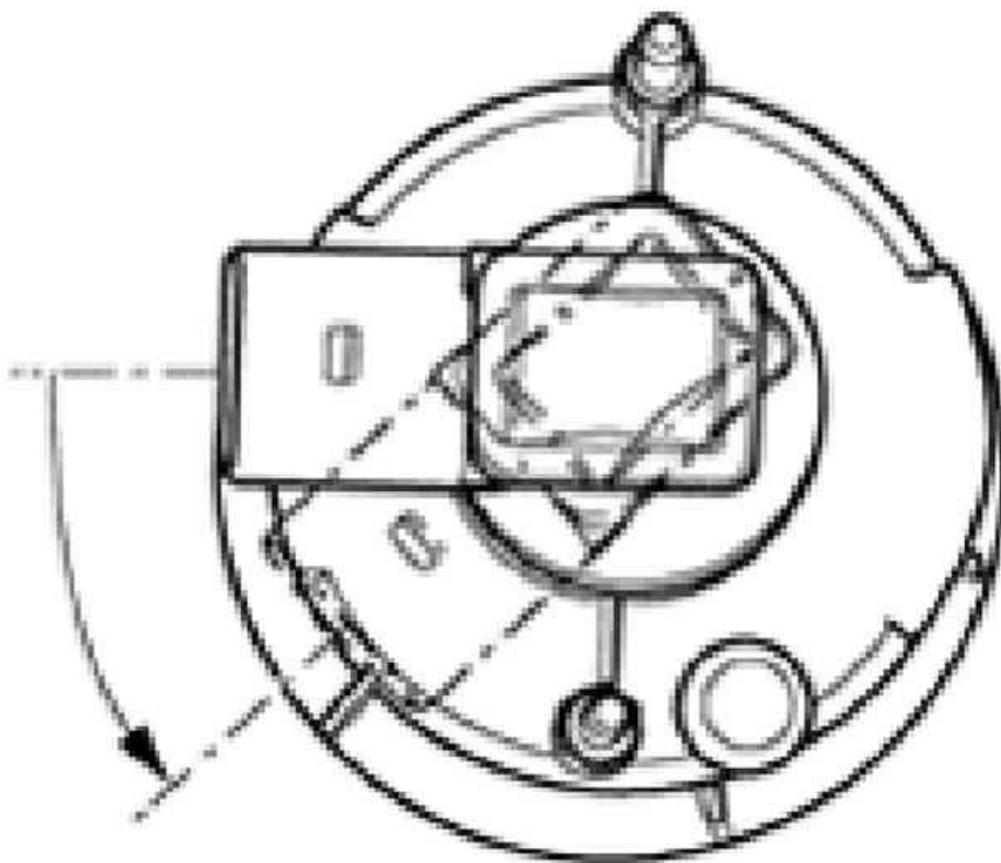
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Fig. 5: Disconnecting 4-Pin Connectors From Ignition Coils (Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Continuation for all vehicles

- Remove fuse 32

NOTE: By removing fuse 32, voltage supply to the fuel injectors is interrupted. Fuse holder is located behind access panel at far left end of dash.



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Fig. 6: Locating Fuse 32
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Test Data, Spark Plugs

TEST DATA, SPARK PLUGS SPECIFICATIONS

Engine code	APH	AWP	AWV
Ignition sequence	1-3-4-2	1-3-4-2	1-3-4-2
Spark plugs			
VW/Audi	101,000,063 AA	101,000,063 AA	101,000,063 AA
Manufacturer code	PFR 6 Q	PFR 6 Q	PFR 6 Q
Tightening torque	30 Nm	30 Nm	30 Nm
Spark plug gap	max. 0.8 mm	max. 0.8 mm	max. 0.8 mm

Engine Control Module (ECM)⁽¹⁾			
System identification	Motronic ME7.5	Motronic ME7.5	Motronic ME7.5
Terminals at Engine Control Module (ECM)	121	121	121
Part number	See Parts Catalog	See Parts Catalog	See Parts Catalog
Engine speed (RPM) limitation RPM	from approx. 6500	from approx. 6800	from approx. 6800
(1) Replacing Engine Control Module (ECM), see <u>REPLACING ENGINE CONTROL MODULE (ECM).</u>			

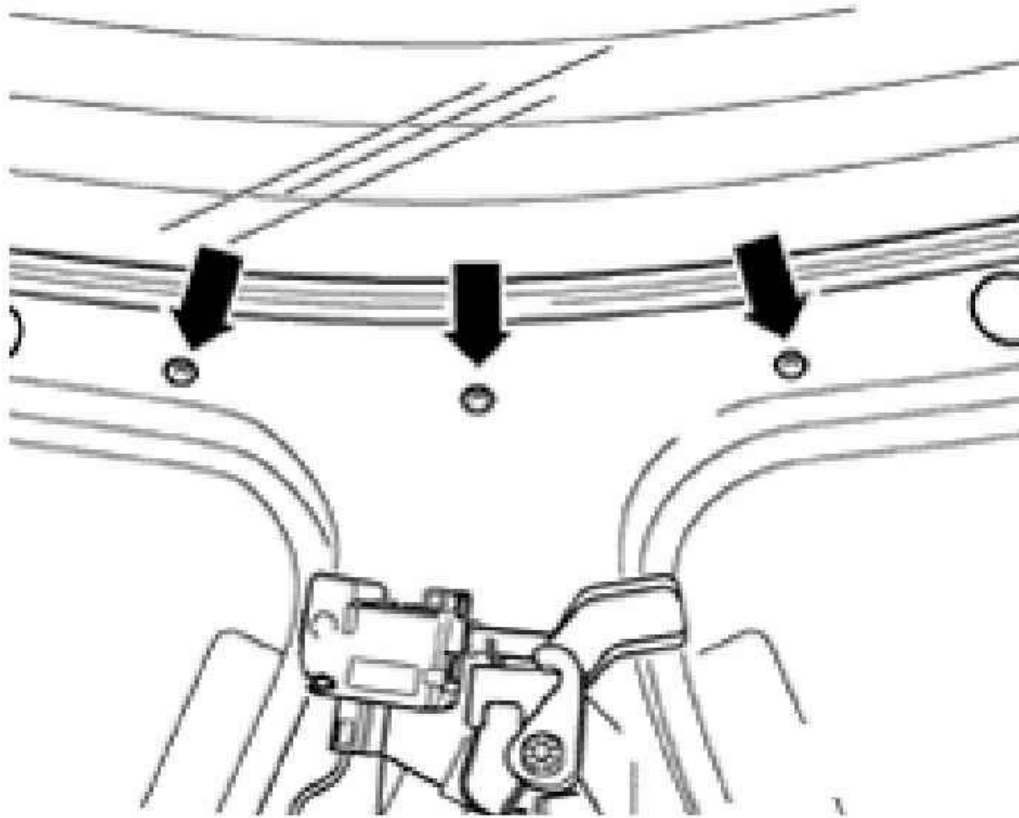
Check Camshaft Position (CMP) sensor

Recommended special tools and equipment

- VAG1526 multimeter or VAG1715 multimeter
- VAG1594 connector test kit
- Wiring diagram

Test requirements

- The respective fuses of Motronic Engine Control Module (ECM) -J220- must be OK. Fuse holder is located behind access panel at far left end of dash.



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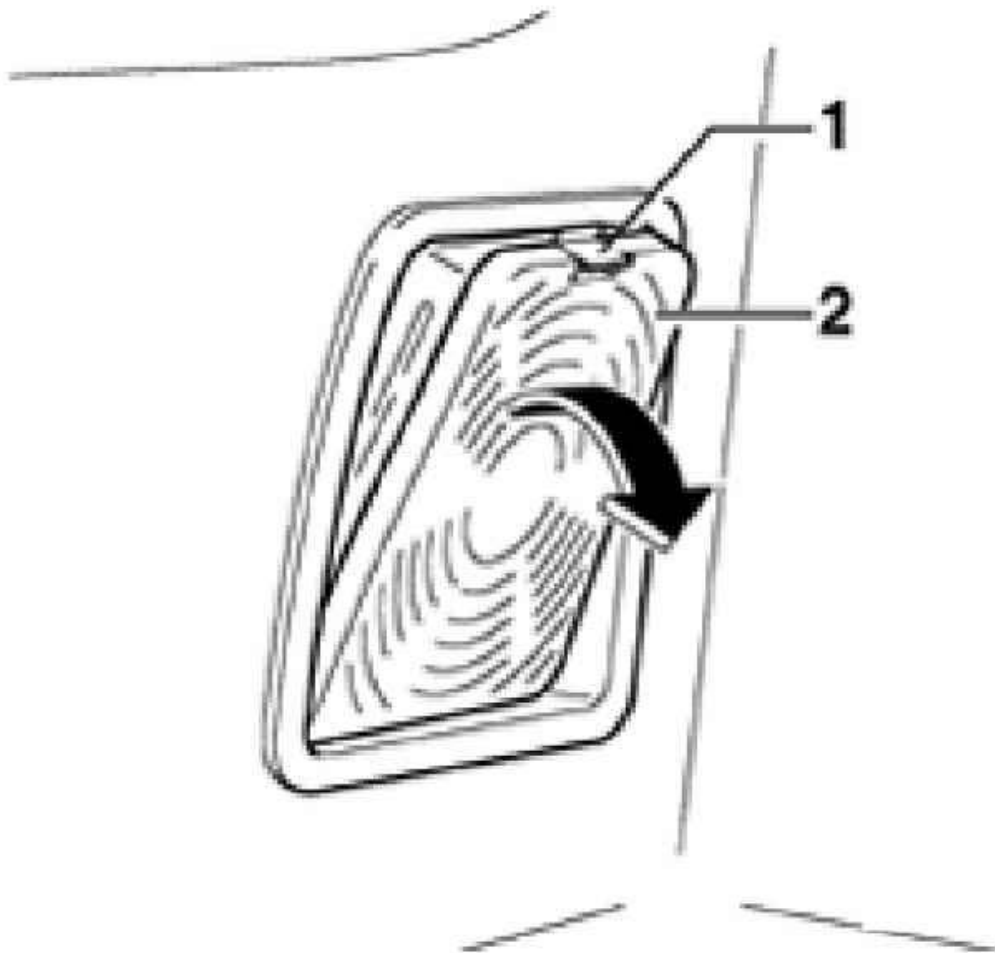
Fig. 7: Identifying Fuses

Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Battery voltage must be at least 11.5 volts.
- All electrical consumers such as, for example, lights and rear window defroster must be switched off.
- Parking brake must be engaged or else daylight driving lights will be switched on.
- Ground (GND) connections between engine and chassis must be OK.

Test sequence

- Disconnect 3-pin connector -1- from Camshaft Position (CMP) sensor -2-.



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Fig. 8: Disconnecting 3-Pin Connector From Camshaft Position (CMP) Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect multimeter to terminal 1 (B+) and 3 (Ground -GND-) of the respective connector for Camshaft Position (CMP) sensor for voltage measurement.
- Switch ignition on.

Specified value: at least 4.5 V

- Switch ignition off.

If there is no voltage:

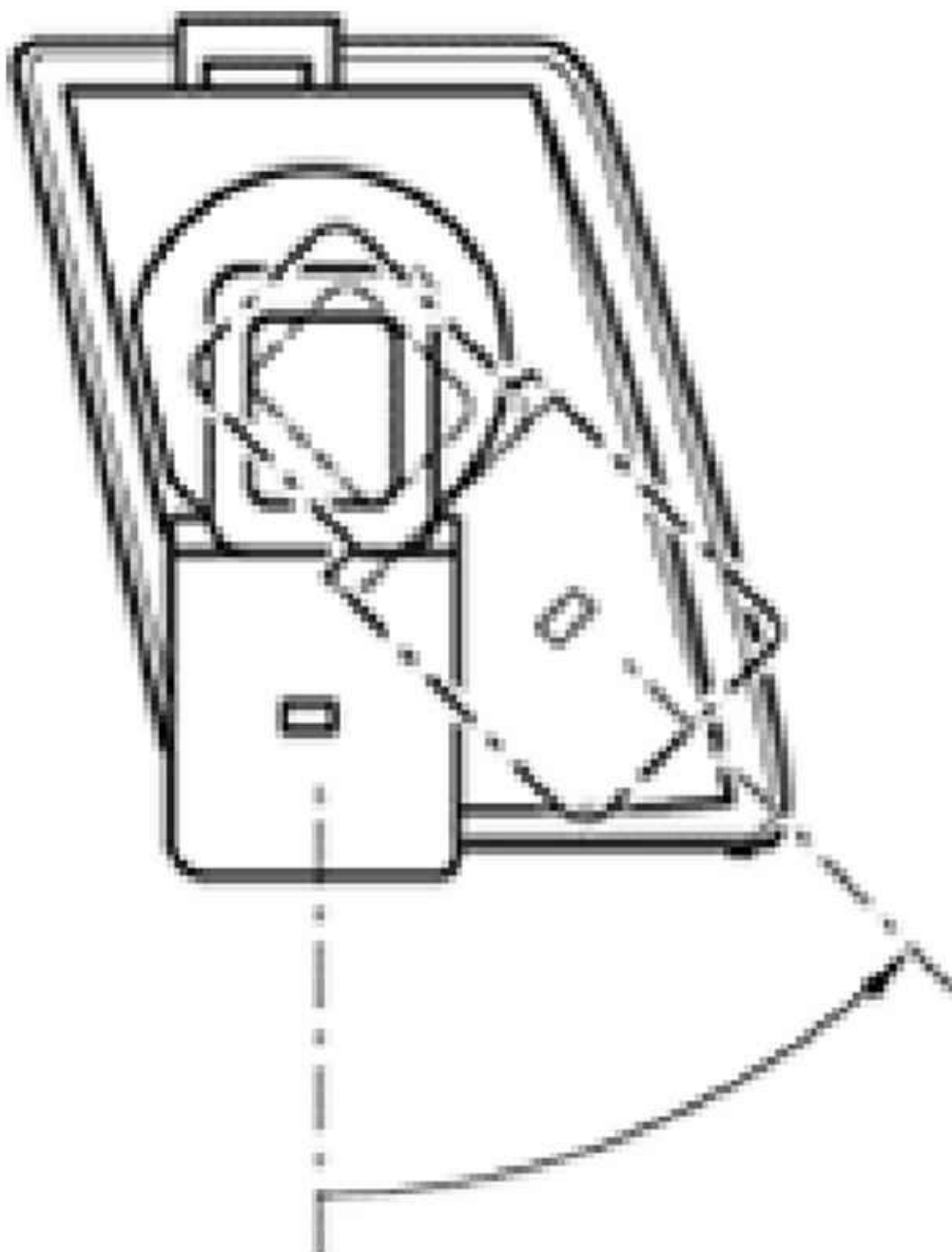
- Connect test box to control module wiring harness, see **CONNECT TEST BOX FOR WIRING TEST** .
- Check for open circuits in wires between test box and connector according to wiring diagram.

Terminal 1+socket 98

Terminal 2+socket 86

Terminal 3 + socket 108

Wire resistance: max. 1.5 ohm



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Fig. 9: Identifying CMP Sensor 3-Pin Harness Connector Terminals

Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Also check wires for short circuit to each other.

Specified value:INFINITY ohm

If no malfunctions are found in the wires and there was voltage between terminals 1 + 3:

- Replace Camshaft Position (CMP) sensor:
 - Vehicles with engine code APH, see item 7 .
 - Vehicles with engine code AWP, AWPV, see item 7 .
- Erase DTC memory of Engine Control Module (ECM), see **DIAGNOSTIC MODE 4: RESET/ERASE DIAGNOSTIC DATA** .
- generate readiness code, see **READINESS CODE, GENERATING** .

If no malfunctions are found in wires and there was no voltage between terminals 1 + 3:

- Replace Engine Control Module (ECM), see **REPLACING ENGINE CONTROL MODULE (ECM)** .

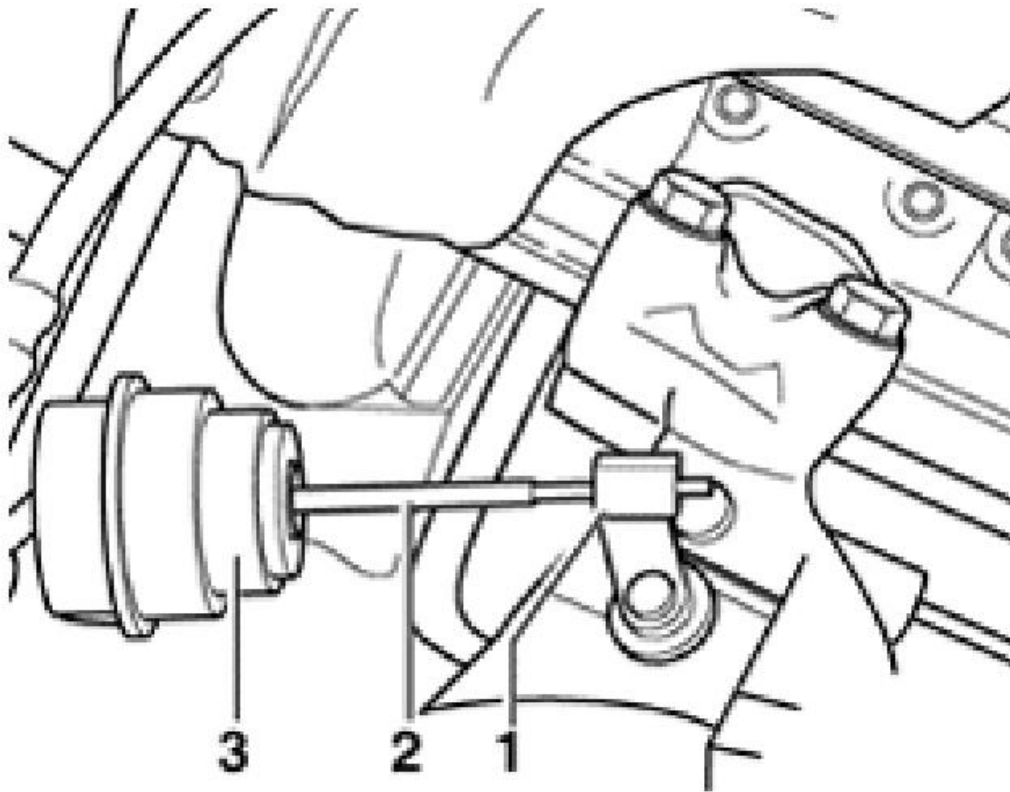
Ignition coils with power output stages, checking

Recommended special tools and equipment

- VAG1526 multimeter or VAG1715 multimeter
- VAG1527 voltage test lamp
- VAG1594 connector test kit
- Wiring diagram

Test requirements

- Respective fuses must be OK.
- Fuel Pump (FP) Relay -J17- must be OK. Fuse box is located behind access panel at far left end of dash.



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Fig. 10: Identifying Fuses Box

Courtesy of VOLKSWAGEN OF AMERICA, INC.

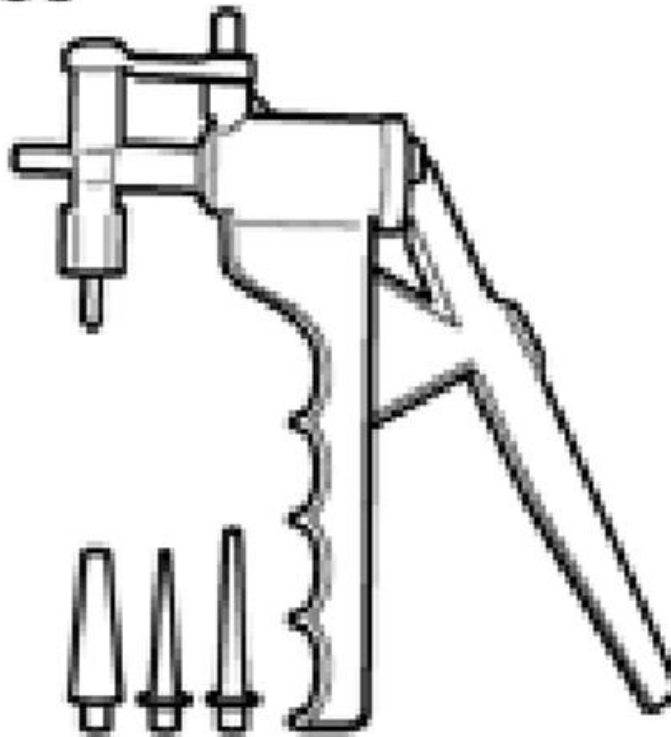
- Battery voltage must be at least 11.5 volts.
- All electrical consumers such as, for example, lights and rear window defroster must be switched off.
- Parking brake must be engaged or else daylight driving lights will be switched on.
- If vehicle is equipped with an A/C system, it must be switched off.
- Ground (GND) connections between engine and chassis must be OK.
- Engine speed (RPM) sensor must be OK, checking, see **CHECK ENGINE SPEED (RPM) SENSOR** .
- Camshaft Position (CMP) sensors must be OK, checking, see **CHECK CAMSHAFT POSITION (CMP) SENSOR** .
- Ignition switched off.

Checking voltage supply

Vehicles with engine code APH

- Disconnect 4-pin connector -2- from ignition coil -1- to be checked.

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Fig. 11: Disconnecting 4-Pin Connector From Ignition Coil (Engine Code APH)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Measure supply voltage between terminals 1 + 2 and 1 + 4 of disconnected connector using the multimeter.
- Switch on ignition.

Specified value: at least 11.5 V

- Switch ignition off.

If there is no voltage:

- Check wire between 4 -pin connector terminal 1 and Motronic Engine Control Module (ECM) Power Supply Relay (main relay) for open circuit according to wiring diagram.

Wire resistance: max. 1.5 ohm

- Check wires between 4 -pin connector and Ground (GND) for open circuit according to wiring diagram.

Terminal 2 and Ground (GND)

Terminal 4 and Ground (GND)

Wire resistance: max. 1.5 ohm

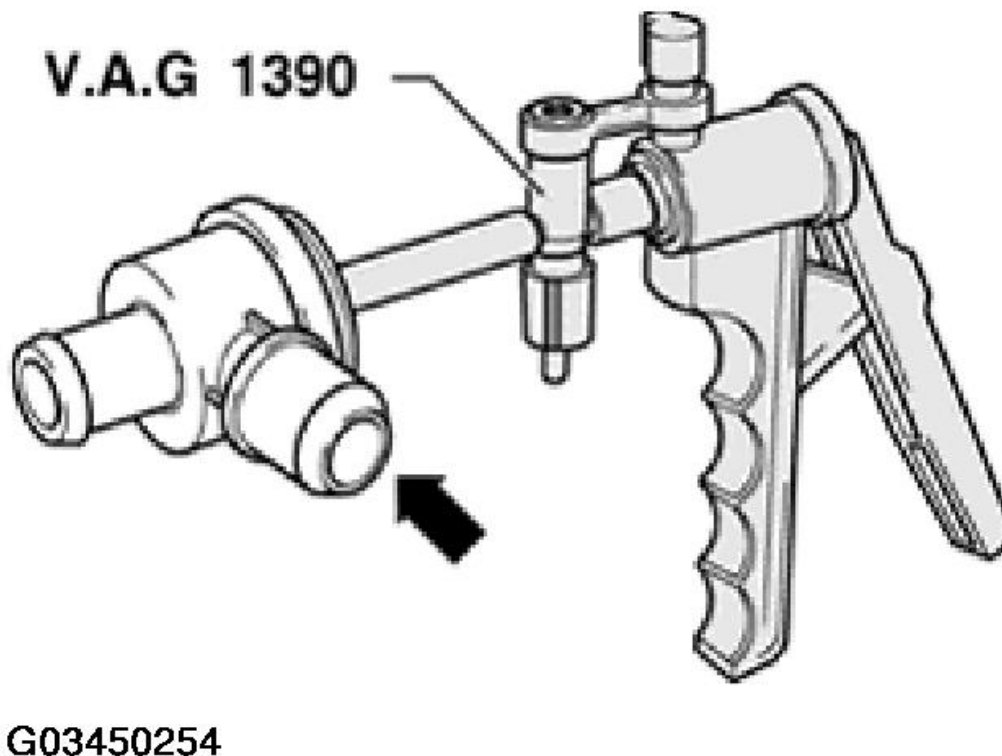
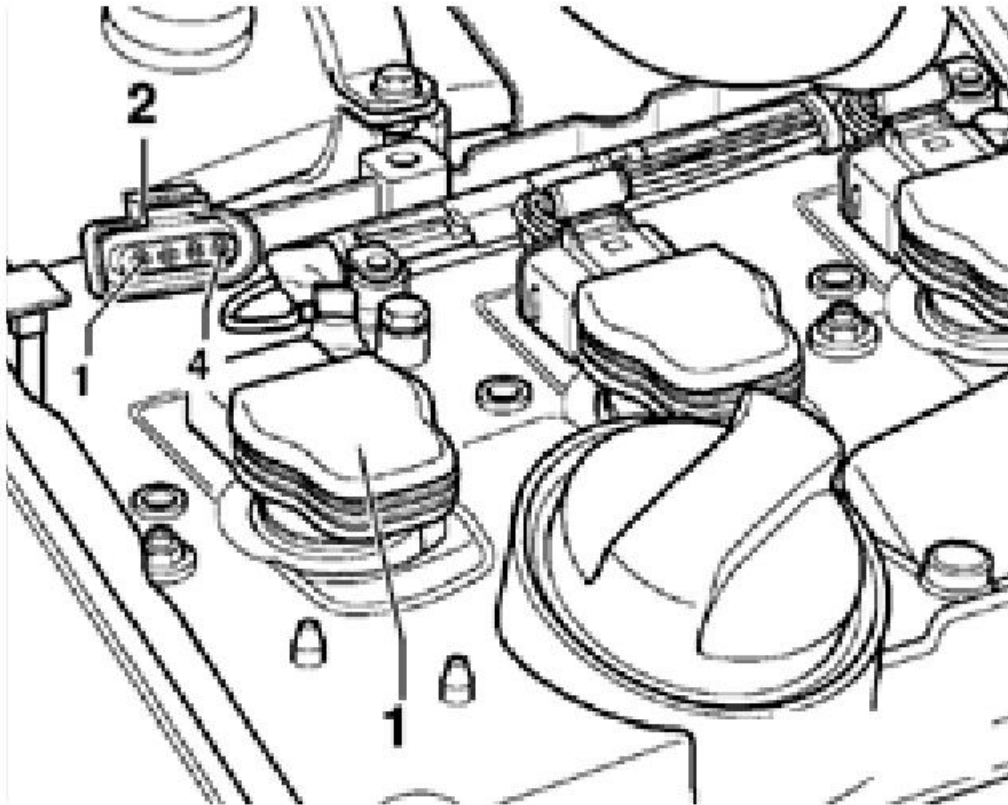


Fig. 12: Identifying 4-Pin Harness Connector Terminals (Engine Code APH)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Vehicles with engine code AWP, AWV

- Disconnect 4-pin connector -2- from ignition coil -1- to be checked.



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Fig. 13: Disconnecting 4-Pin Connector From Ignition Coil (Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Measure supply voltage between terminals 1 + 2 and 1 + 4 of disconnected connector using the multimeter.
- Switch on ignition.

Specified value: at least 11.5 V

- Switch ignition off.

If there is no voltage:

- Check wire between 4 -pin connector terminal 1 and Motronic Engine Control Module (ECM) Power Supply Relay (main relay) for open circuit according to wiring diagram.

Wire resistance: max. 1.5 ohm

- Check wires between 4 -pin connector and Ground (GND) for open circuit according to wiring diagram.

Terminal 2 and Ground (GND)

Terminal 4 and Ground (GND)

Wire resistance: max. 1.5 ohm

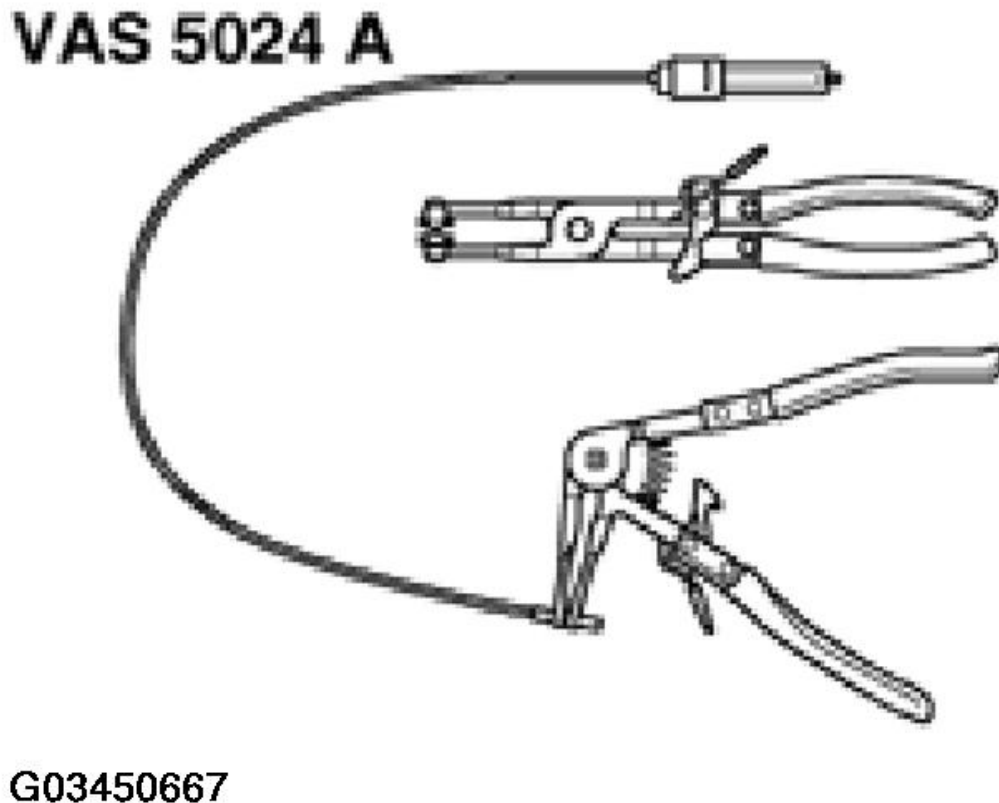


Fig. 14: Identifying 4-Pin Harness Connector Terminals (Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Continuation for all vehicles

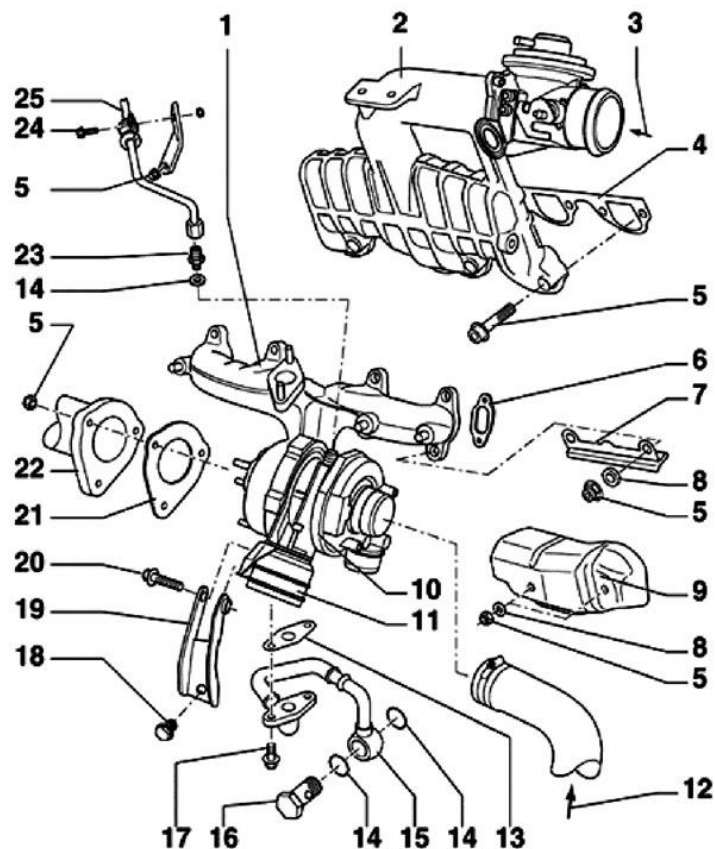
If there is no malfunction in voltage supply:

- Check activation, see **CHECKING ACTIVATION**

Checking activation

- Remove fuse 32

NOTE: By removing fuse 32, voltage supply to the fuel injectors is interrupted.
Fuse box is located behind access panel at far left end of dash.

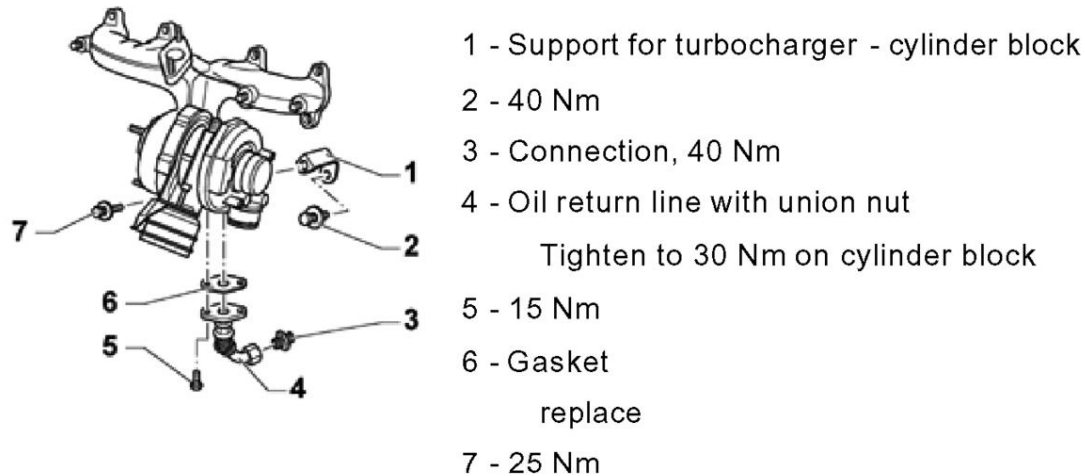


- | | |
|----------------------------|---------------------------|
| 1 - Exhaust manifold | 14 - Seal |
| 2 - Intake manifold | 15 - Oil return line |
| 3 - From charge air cooler | 16 - Banjo fitting, 40 Nm |
| 4 - Gasket | 17 - 15 Nm |
| 5 - 25 Nm | 18 - 40 Nm |
| 6 - Gasket | 19 - Brace |
| 7 - Bracket | 20 - 25 Nm |
| 8 - Washer | 21 - Gasket |
| 9 - Heat shield | 22 - Front exhaust pipe |
| 10 - Turbocharger | 23 - Connecting piece |
| 11 - Vacuum diaphragm | 24 - 10 Nm |
| 12 - From air filter | 25 - Oil supply line |
| 13 - Gasket | |

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Fig. 15: Locating Fuse 32
 Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect diode test lamp to
terminals 2 + 3 of disconnected connector.



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Fig. 16: Identifying 4-Pin Harness Connector Terminals (Engine Code APH)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Vehicles with engine code AWP, AWV

- Connect diode test lamp to
terminals 2 + 3 of disconnected connector.

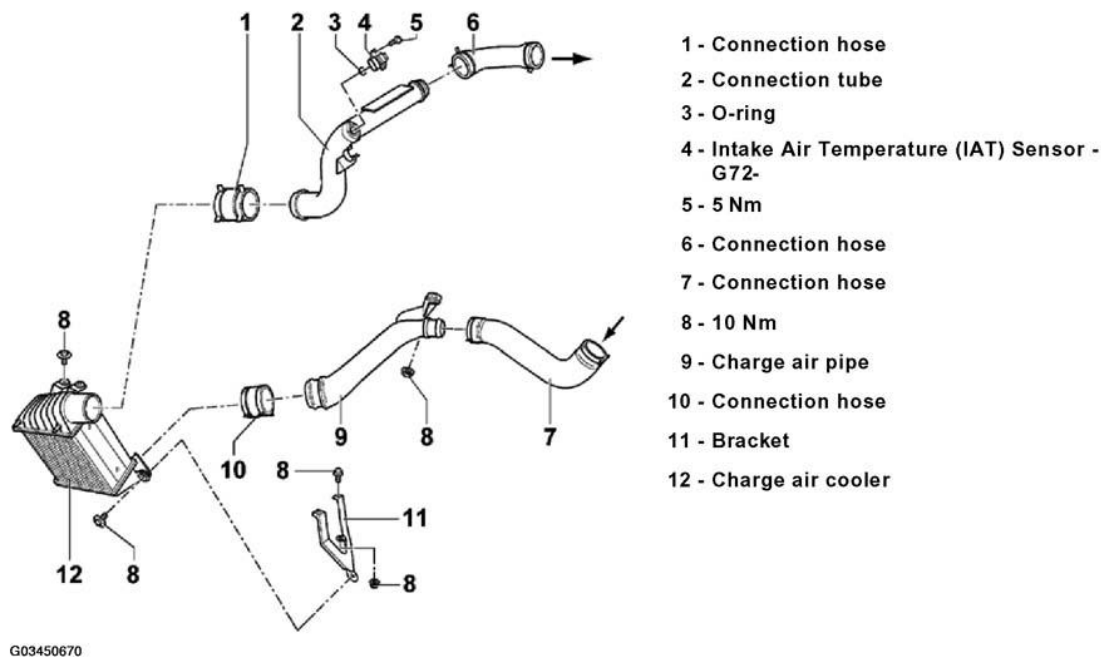


Fig. 17: Identifying 4-Pin Harness Connector Terminals (Engine Code AWP, AWV)
 Courtesy of VOLKSWAGEN OF AMERICA, INC.

Continuation for all vehicles

- Operate starter and test ignition signal from Engine Control Module (ECM).

LED should flicker.

- Switch ignition off.

If LED flickers and voltage supply is OK:

- Replace ignition coils with power output stage:
 - Vehicles with engine code APH, see item 2 .
 - Vehicles with engine code AWP, AWV, see item 2 .
 - Erase DTC memory of Engine Control Module (ECM), see **DIAGNOSTIC MODE 4: RESET/ERASE DIAGNOSTIC DATA** .
- generate readiness code, see **READINESS CODE, GENERATING** .

If LED does not flicker:

- Check wires, see **CHECKING WIRING**

- Connect test box to control module wiring harness, see **CONNECT TEST BOX FOR WIRING TEST** .

Vehicles with engine code APH

- Check wires between test box and 4-pin connector for open circuit according to wiring diagram.

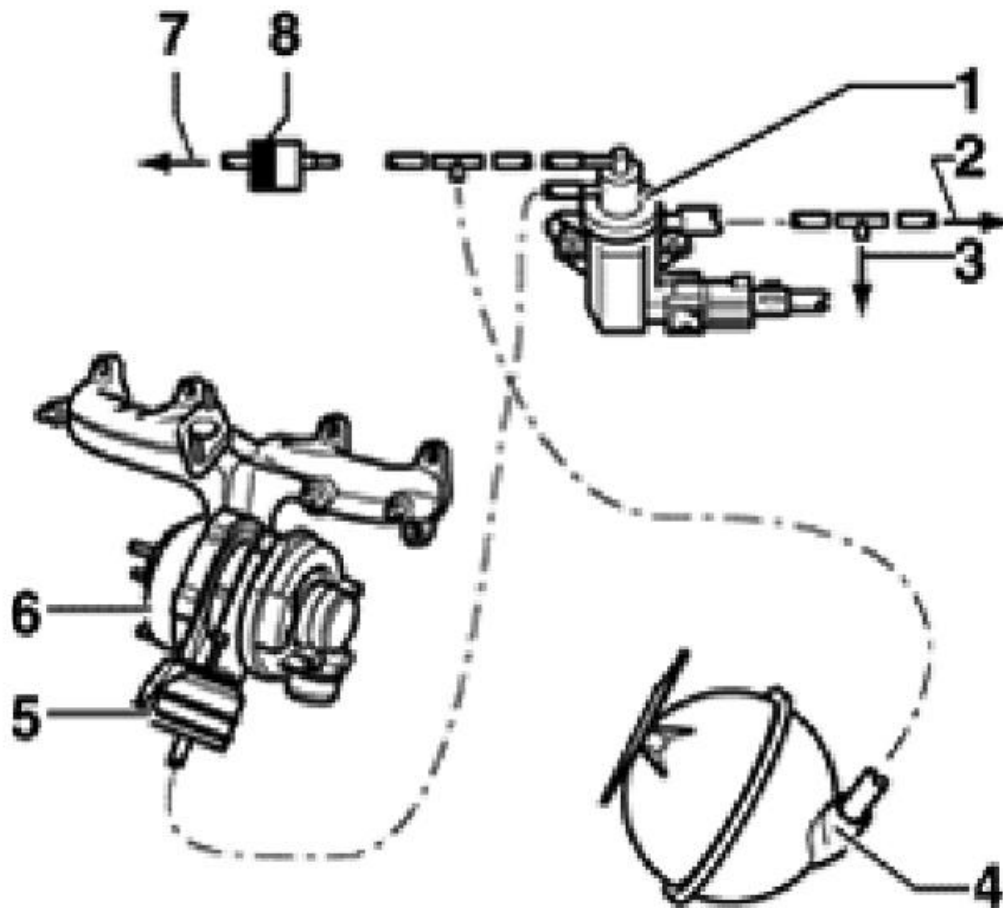
Cylinder 1 terminal 3 + socket 102

Cylinder 2 terminal 3 + socket 95

Cylinder 3 terminal 3 + socket 103

Cylinder 4 terminal 3 + socket 94

Wire resistance: max. 1.5 ohm



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Fig. 18: Identifying 4-Pin Harness Connector Terminals (Engine Code APH)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Vehicles with engine code AWP, AWV

- Check wires between test box and 4-pin connector for open circuit according to wiring diagram.

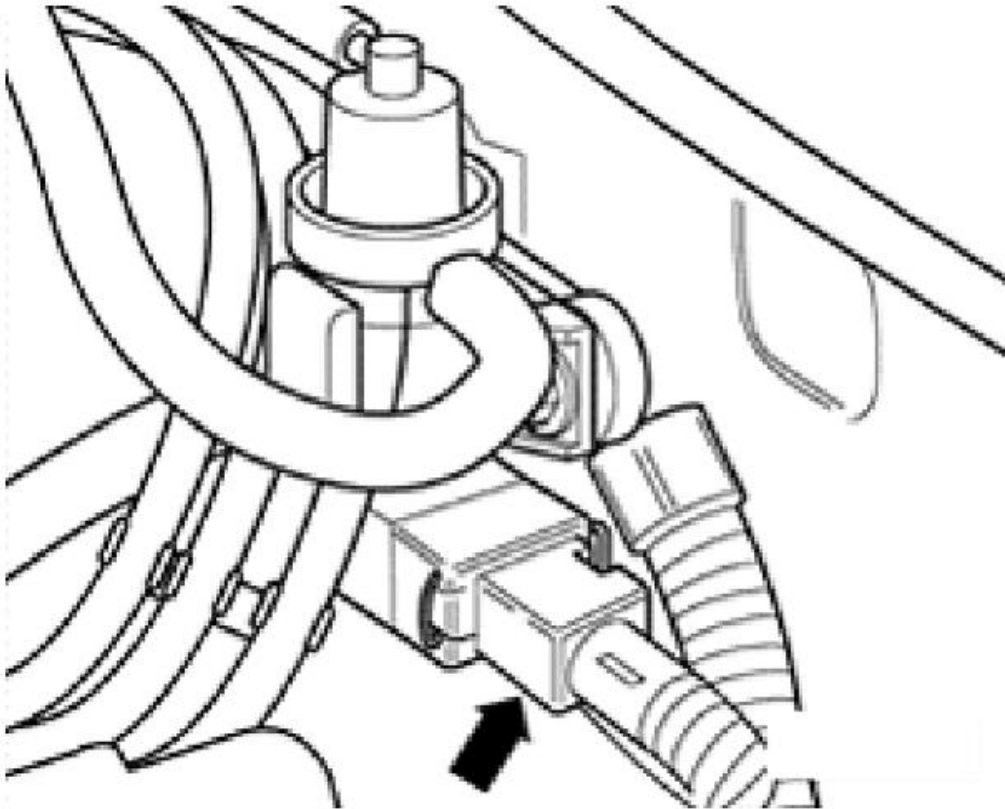
Cylinder 1 terminal 3 + socket 102

Cylinder 2 terminal 3 + socket 95

Cylinder 3 terminal 3 + socket 103

Cylinder 4 terminal 3 + socket 94

Wire resistance: max. 1.5 ohm



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Fig. 19: Identifying 4-Pin Harness Connector Terminals (Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Continuation for all vehicles

- Check wires for short circuit to each other.

If there is no malfunction in wire connections:

- Replace Engine Control Module (ECM), see **REPLACING ENGINE CONTROL MODULE (ECM)** .

Check knock sensors

- Contact surfaces between knock sensor and cylinder block must be free of corrosion, dirt and grease.
- For the Knock Sensors to function properly, it is important for tightening torque to be exactly 20 Nm.
- Use only gold-plated terminals when servicing terminals in harness connector of knock sensors.

Recommended special tools and equipment

- VAG1526 multimeter or VAG1715 multimeter
- VAG1594 connector test kit
- Wiring diagram

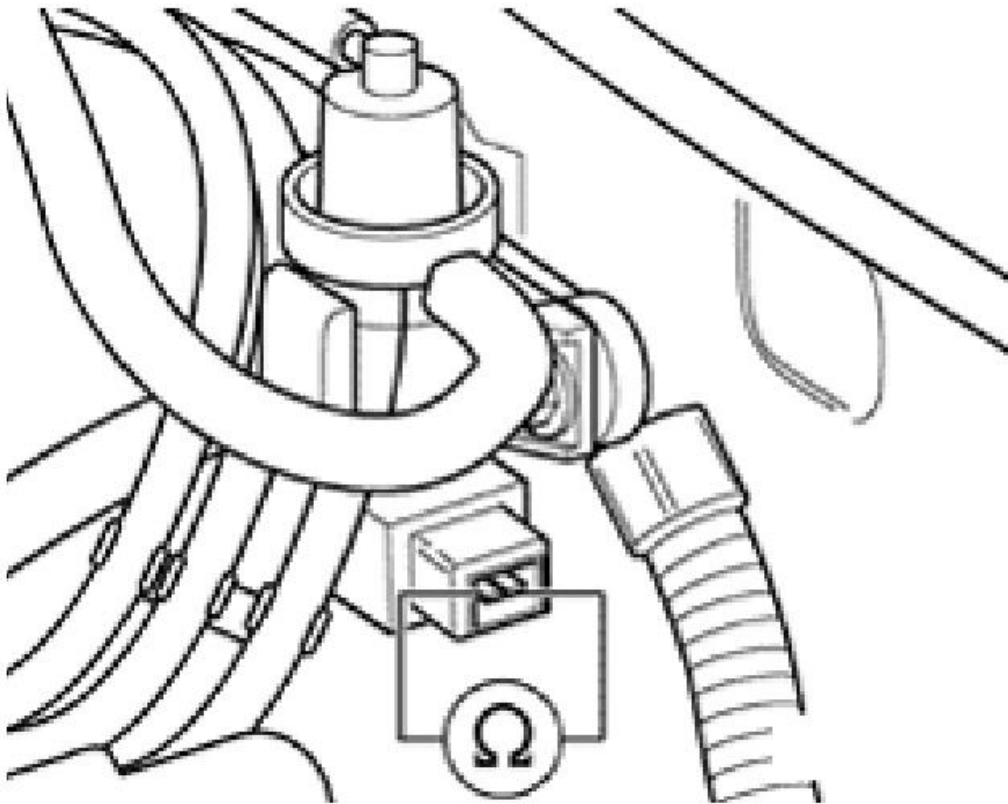
Test requirements

- Knock sensor securing bolt tightened to 20 Nm.
- On Board Diagnostic (OBD) must have recognized a malfunction at one or both of the Knock Sensors (KS).
- Ignition switched off.

Checking resistance values of knock sensors

Vehicles with engine code APH

- Disconnect 2-pin harness connector to Knock Sensor (KS) 1 -G61-(-1-) and/or 2 -pin harness connector to Knock Sensor (KS) 2 -G66-(-2-).

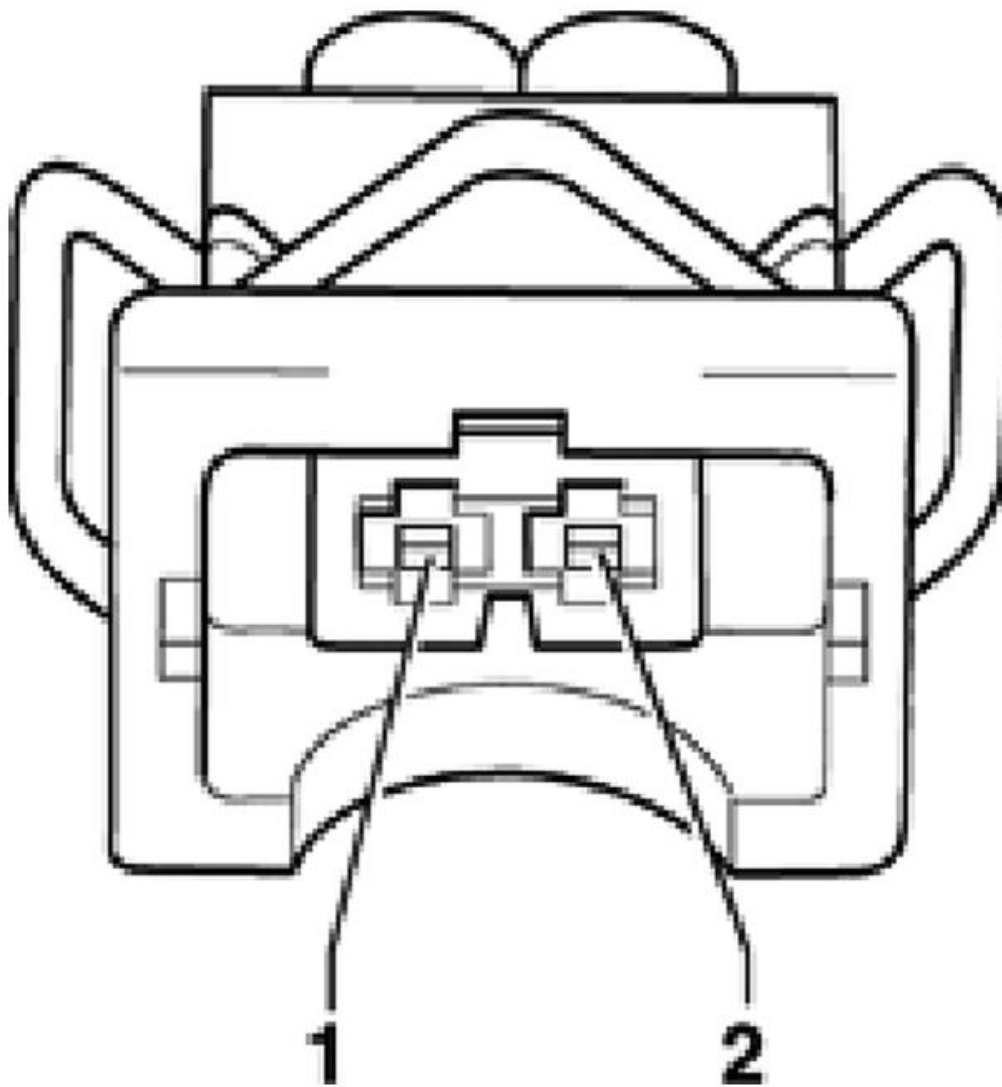


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Fig. 20: Disconnecting 2-Pin Harness Connector To Knock Sensor (Engine Code APH)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Measure resistance from knock sensor between terminal 1 (signal) and terminal 2 (Ground -GND-).

Specified value: INFINITY ohm



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Fig. 21: Measuring Resistance Between Knock Sensor Terminal 1 (Signal) And Terminal 2 (Ground -Gnd-) - Engine Code APH

Courtesy of VOLKSWAGEN OF AMERICA, INC.

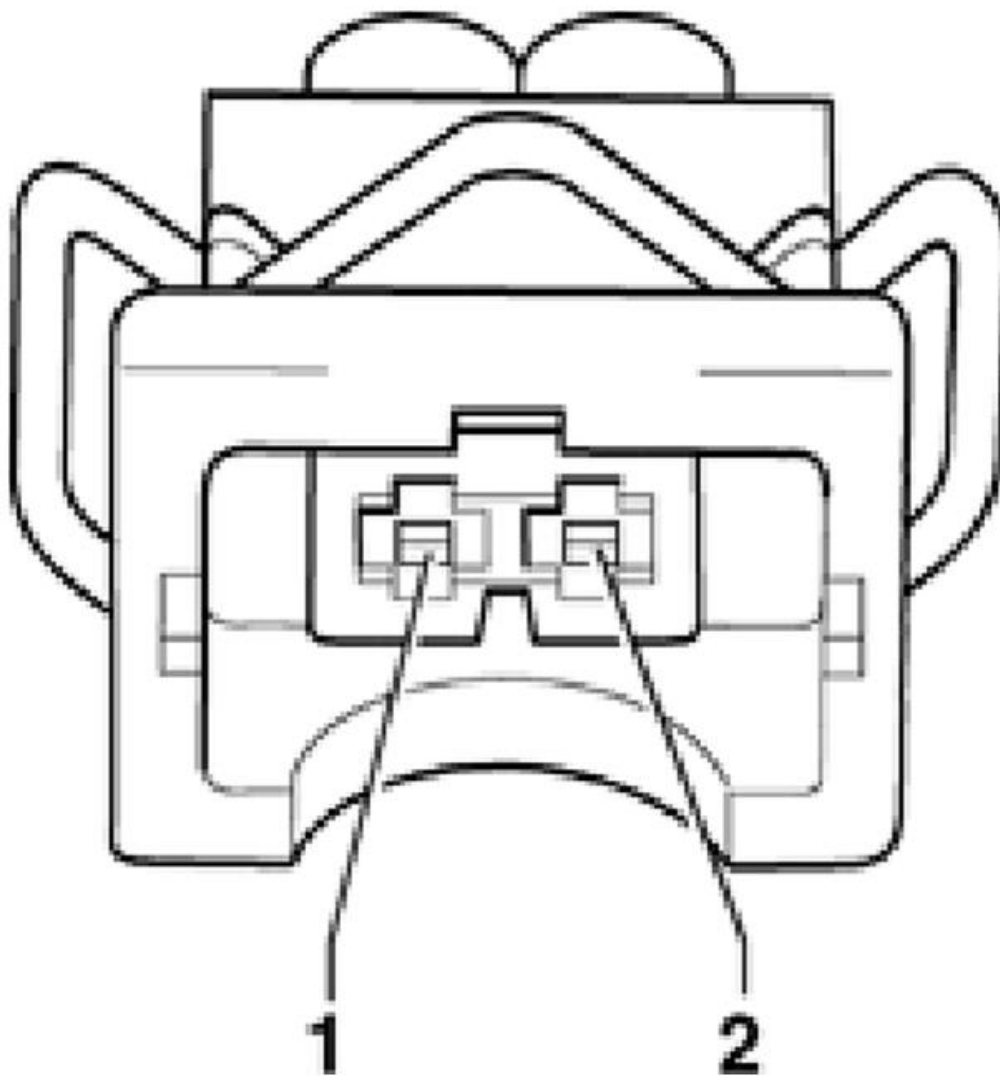
If specified value is not obtained:

- Replace the respective knock sensor:
 - Knock Sensor (KS) 1 -G61-, see item 12 .

- Knock Sensor (KS) 2 -G66-, see item 17 .
- Erase DTC memory of Engine Control Module (ECM), see **DIAGNOSTIC MODE 4: RESET/ERASE DIAGNOSTIC DATA** .
- generate readiness code, see **READINESS CODE, GENERATING** .

Vehicles with engine code AWP, AWV

- Disconnect 2-pin harness connector to Knock Sensor (KS) 1 -G61-(-1-) and/or 2 -pin harness connector to Knock Sensor (KS) 2 -G66-(-2-).

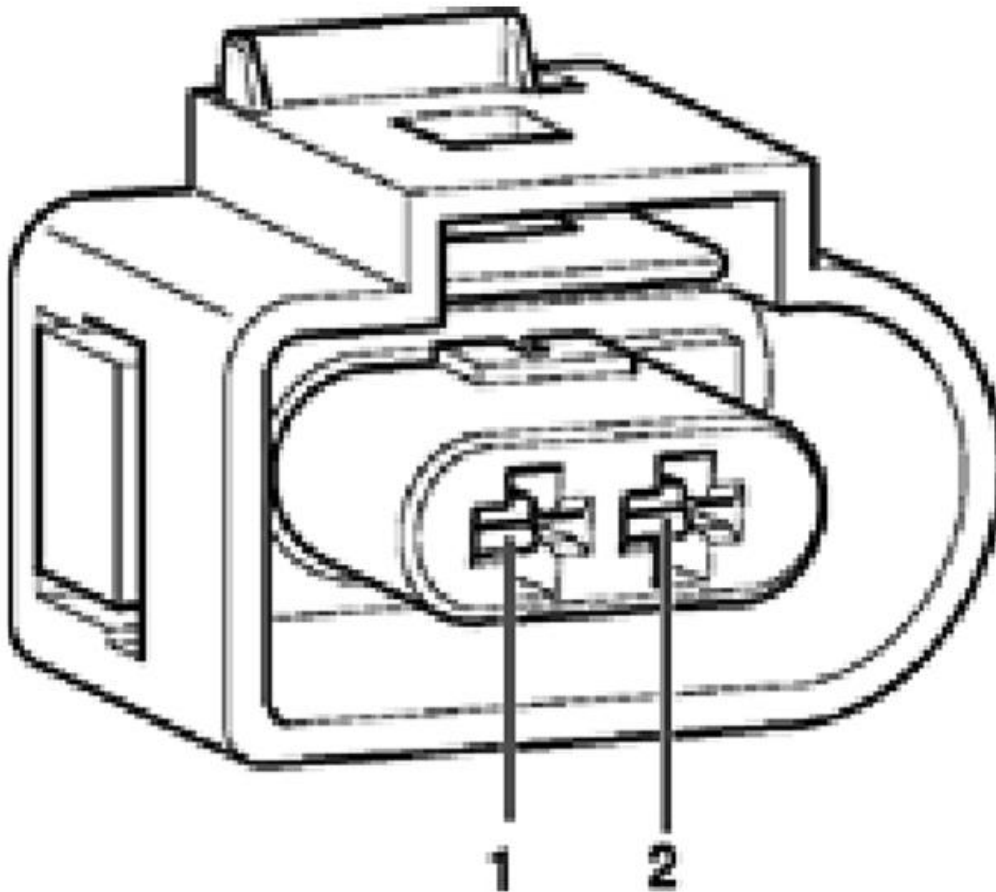


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Fig. 22: Disconnecting 2-Pin Harness Connector To Knock Sensor (Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Measure resistance between terminals 1 + 2 at connectors to knock sensors.

Specified value: ohm



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Fig. 23: Measuring Resistance Between Terminals 1 And 2 (Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If specified value is not obtained:

- Replace the respective knock sensor:
 - Knock Sensor (KS) 1 -G61-, see item 12 .
 - Knock Sensor (KS) 2 -G66-, see item 13 .
- Erase DTC memory of Engine Control Module (ECM), see **DIAGNOSTIC MODE 4: RESET/ERASE DIAGNOSTIC DATA** .
- generate readiness code, see **READINESS CODE, GENERATING** .

Continuation for all vehicles

If specified value is obtained:

- Check wires, see **CHECKING WIRING** .

Checking wiring

- Connect test box to control module wiring harness, see **CONNECT TEST BOX FOR WIRING TEST** .

Vehicles with engine code APH

- Check wiring between test box and 3 -pin connector for open circuit according to wiring diagram.

Terminal 1 + socket

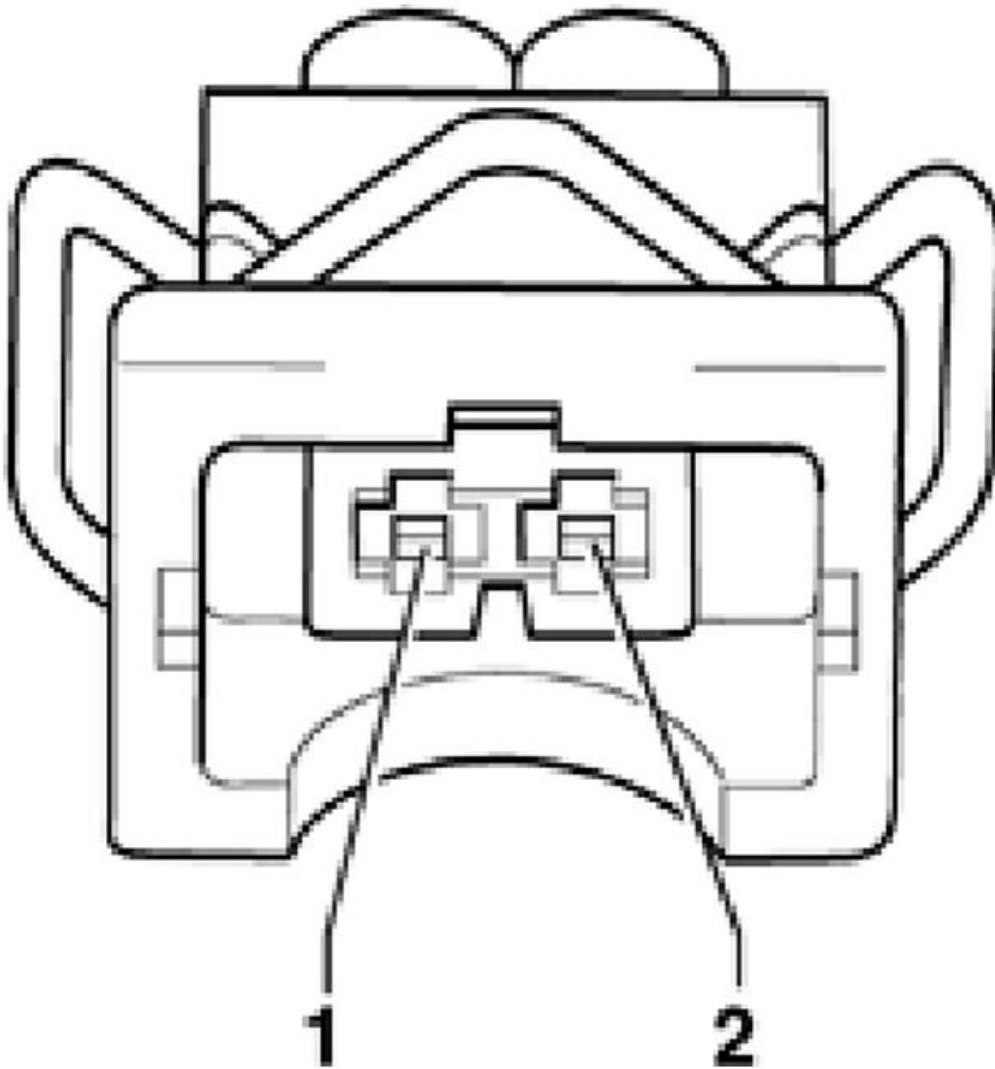
106 (Knock Sensor (KS) 1 -G61-)

107 (Knock Sensor (KS) 2 -G66-)

Terminal 2 + socket

99 (Knock Sensor (KS) 1 -G61-)

99 (Knock Sensor (KS) 2 -G66-)



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Fig. 24: Identifying Knock Sensor Harness Connector Terminals (Engine Code APH)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Wire resistance: max. 1.5 ohm
- Also check wires for short circuit to each other.

Specified value: INFINITY ohm

If specified value is not obtained:

- Replace the respective knock sensor:
 - Knock Sensor (KS) 1 -G61-, see item 12 .
 - Knock Sensor (KS) 2 -G66-, see item 17 .
- Erase DTC memory of Engine Control Module (ECM), see **DIAGNOSTIC MODE 4: RESET/ERASE DIAGNOSTIC DATA** .
- generate readiness code, see **READINESS CODE, GENERATING** .

Vehicles with engine code AWP, AWW

- Check wires between test box and 2-pin connector for open circuit according to wiring diagram.

Terminal 1 + socket

106 (Knock Sensor (KS) 1 -G61-)

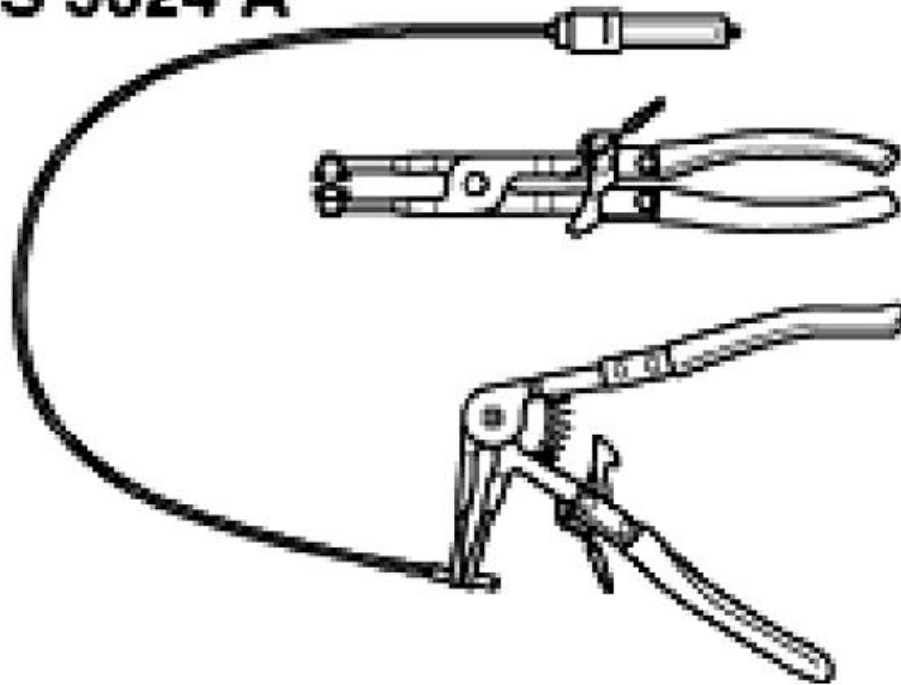
107 (Knock Sensor (KS) 2 -G66-)

Terminal 2 + socket

99 (Knock Sensor (KS) 1 -G61-)

99 (Knock Sensor (KS) 2 -G66-)

VAS 5024 A



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Fig. 25: Identifying Knock Sensor 2-Pin Harness Connector Terminals (Engine Code AWP, AWV)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Wire resistance: max. 1.5 ohm
- Also check wires for short circuit to each other.

Specified value: ohm

If specified value is not obtained:

- Replace the respective knock sensor:
 - Knock Sensor (KS) 1 -G61-, see item 12 .
 - Knock Sensor (KS) 2 -G66-, see item 13 .
- Erase DTC memory of Engine Control Module (ECM), see **DIAGNOSTIC MODE 4: RESET/ERASE DIAGNOSTIC DATA** .
- generate readiness code, see **READINESS CODE, GENERATING** .

Valve for camshaft adjustment, checking (Vehicles with engine code AWP, AWV)

Function

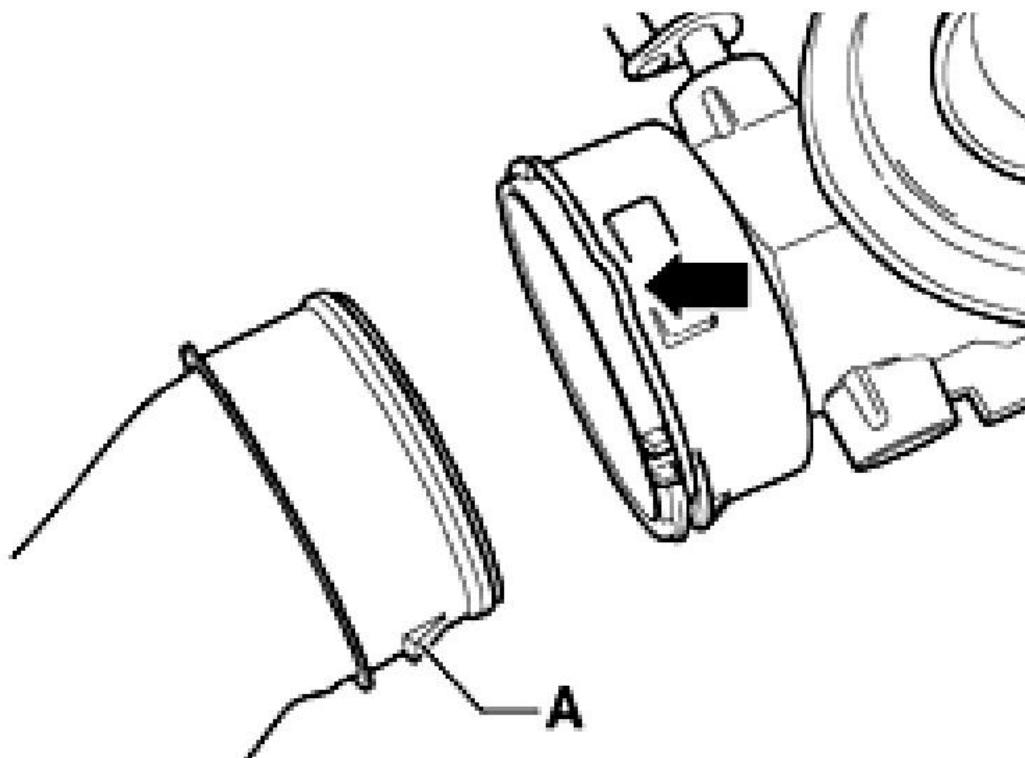
The camshaft adjustment is load - and RPM dependent. The electrical valve for camshaft adjustment switches oil pressure onto camshaft adjuster (mechanical adjustment mechanism), which adjusts the camshaft.

Recommended special tools and equipment

- VAG1526 multimeter or VAG1715 multimeter
- VAG1594 connector test kit
- Wiring diagram

Test requirements

- The respective fuses of the Valve -1- for camshaft adjustment - N205-must be OK.
- Fuel Pump (FP) Relay -J17- must be OK. Fuse box is located behind access panel at far left end of dash.



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Fig. 26: Identifying Fuses

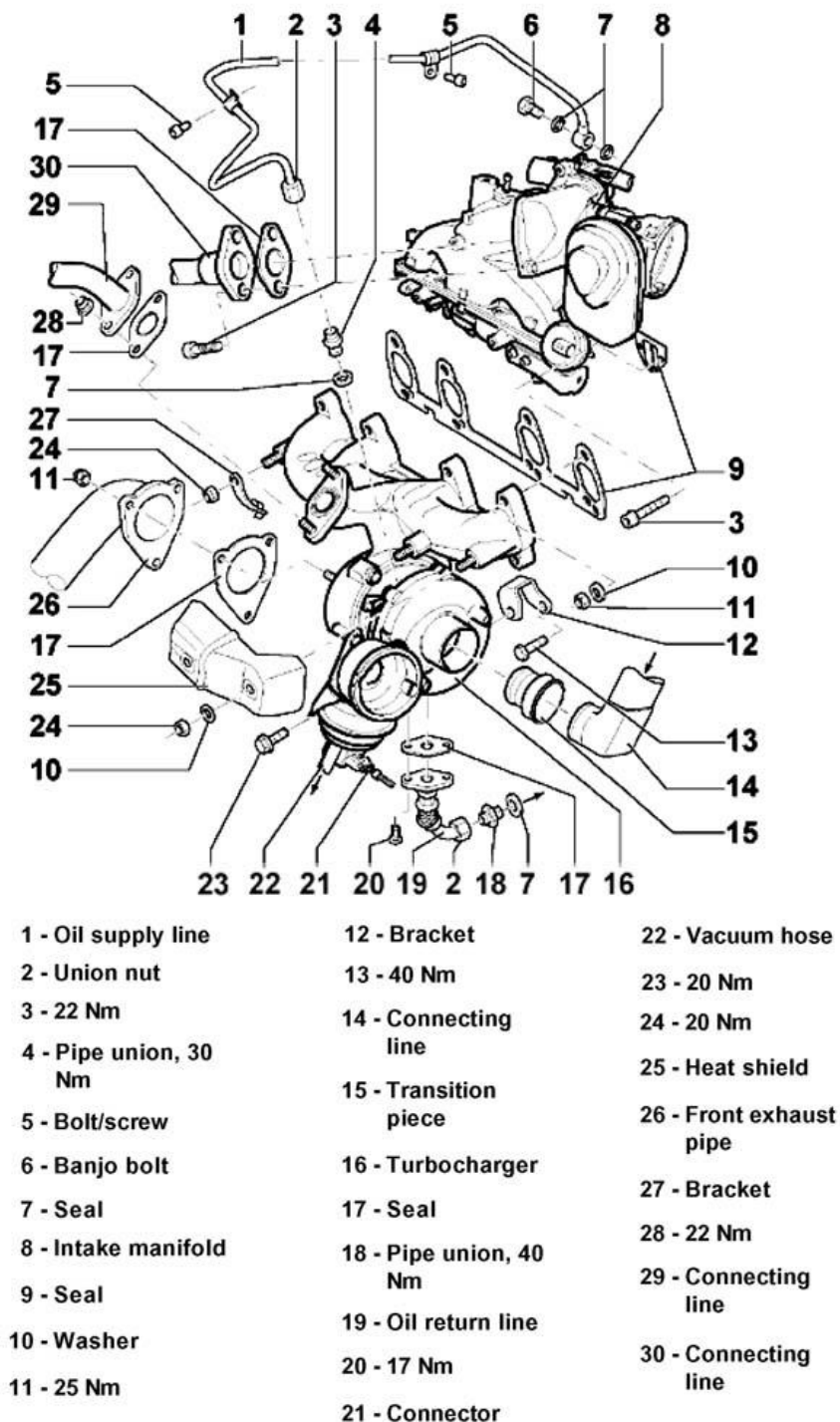
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Battery voltage must be at least 11.5 volts.
- All electrical consumers such as, for example, lights and rear window defroster must be switched off.
- Parking brake must be engaged or else daylight driving lights will be switched on.
- If vehicle is equipped with an A/C system, it must be switched off.
- Ground (GND) connections between engine and chassis must be OK.
- Ignition switched off.

Test sequence

- Measure resistance between terminals of the respective valve for camshaft adjustment.

Specified value: 10...18 ohm



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Fig. 27: Measuring Resistance Between Terminals Of Camshaft Adjustment Valve (Engine code AWP, AWW)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

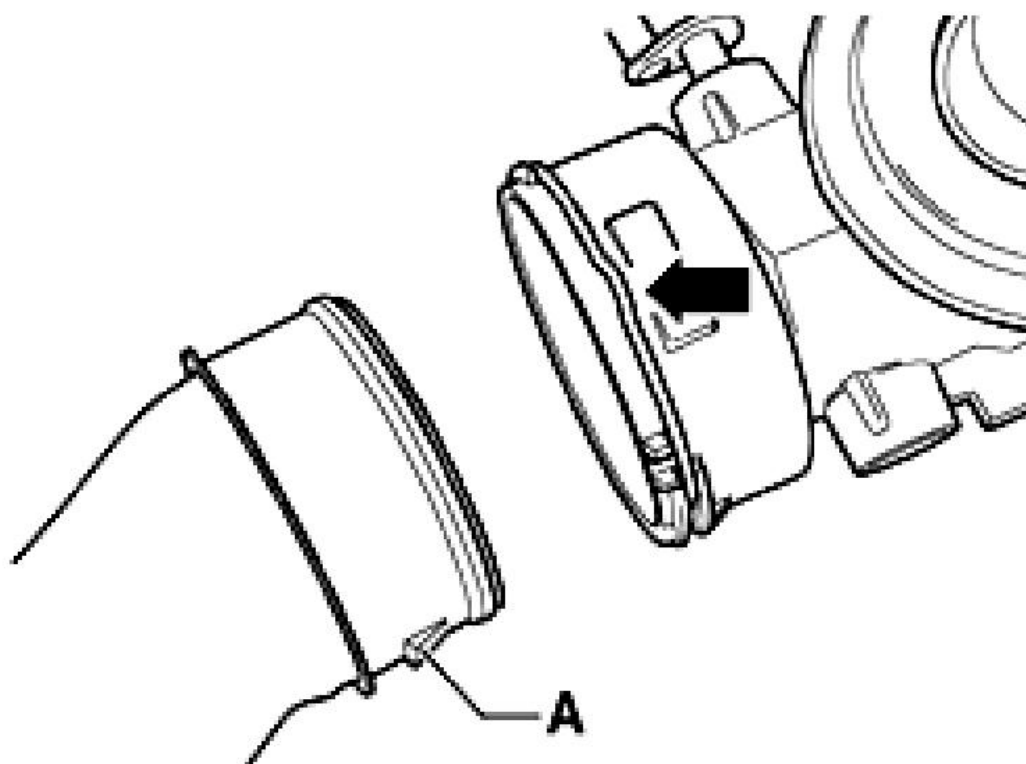
If specified value is not obtained:

- Replace the valve for camshaft adjustment, see item 10 .
- Erase DTC memory of Engine Control Module (ECM), see **DIAGNOSTIC MODE 4: RESET/ERASE DIAGNOSTIC DATA** .
- generate readiness code, see **READINESS CODE, GENERATING** .

If specified value is obtained:

- Connect test box to control module wiring harness, see **CONNECT TEST BOX FOR WIRING TEST** .
- Check wire between test box socket 115 + 2 -pin connector terminal 2 for open circuit according to wiring diagram.

Wire resistance: max. 1.5 ohm



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Fig. 28: Identifying Harness Connector Terminals Of Camshaft Adjustment Valve (Engine code AWP, AWV)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Also check wires for short circuit to B+ and Ground (GND).

Specified value: INFINITY ohm